Post-deployment family violence among UK military personnel

Corresponding Author:

Jamie Kwan[1]

[1] Department of Psychological Medicine, Weston Education Centre, 10 Cutcombe Road, Denmark Hill, London, SE5 9RJ, UK (Email: jamie.kwan@kcl.ac.uk)

Co-Authors:

Margaret Jones[2] (magaret.jones@kcl.ac.uk)

Greta Somaini[3] (greta.somaini@gmail.com)

Lisa Hull[2] (lisa.hull@kcl.ac.uk)

Simon Wessely[2]: (simon.wessely@kcl.ac.uk)

Nicola T Fear[2] (nicola.t.fear@kcl.ac.uk)

Deirdre MacManus[2,3] (deirdre.macmanus@kcl.ac.uk)

[2] King's Centre for Military Health Research, King's College London, London, UK

[3] Department of Forensic and Neurodevelopmental Sciences, Institute of Psychiatry, Psychology and Neuroscience, King's College London, London, UK

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ABSTRACT

Background: Research into violence among military personnel has not differentiated between stranger and family directed violence. While military factors (combat exposure and post-deployment mental health problems) are risk factors for general violence, there has been limited research on their impact on violence within the family environment. This study aims to compare the prevalence of family-directed and stranger-directed violence among a deployed sample of UK military personnel and to explore risk factors associated with both family- and stranger-directed violence.

Method: This study utilised data from a large cohort study which collected information by questionnaire from a representative sample of randomly selected deployed UK military personnel (n=6,711).

Results: The prevalence of family violence immediately following return from deployment was 3.6% and 7.8% for stranger violence. Family violence was significantly associated with having left service, while stranger violence was associated with younger age, male gender, being single, having a history of antisocial behaviour as well as having left service. Deployment in a combat role was significantly associated with both family and stranger violence after adjustment for confounders [adjusted OR (aOR)= 1.92 (1.25-2.94) p=0.003 and aOR=1.77 (1.31-2.40) p<0.001 respectively], as was the presence of symptoms of post-traumatic stress disorder, common mental disorders and aggression.

Conclusions: Exposure to combat and post-deployment mental health problems are risk factors for violence both inside and outside the family environment and should be considered in violence reduction programmes for military personnel. Further research using a validated measurement tool for family violence would improve comparability with other research.

INTRODUCTION

Military life can be challenging for the entire family and it is increasingly recognised that the families of military personnel are impacted by the problems which can affect military personnel both during and after service (Cozza *et al.*, 2005; McFarlane, 2009). Armed Forces health policy in both the US and the UK has shifted in recent years from focusing solely on military personnel to incorporating the wider military family (Ministry of Defence, 2011; Shelton *et al.*, 2015). Similarly, research is increasingly exploring the needs of military families (Rowe *et al.*, 2014; Verey *et al.*, 2016; Tasso *et al.*, 2016).

Research has suggested that aggression and violence is prevalent among military personnel, especially following return from deployment (MacManus *et al.*, 2012; MacManus *et al.*, 2013; Elbogen *et al.*, 2014; MacManus *et al.*, 2015; Kwan *et al.*, 2016). Much of this aggression and violence is likely to be acted out in the family home. Indeed, US research has established that domestic violence and abuse (with a focus on intimate partner violence (IPV)) is prevalent among military populations (Bradley, 2007; McCarroll *et al.*, 2000; Foran *et al.*, 2011; Schmaling *et al.*, 2011). Research has suggested a strong association between military factors, including combat exposure, and IPV perpetration as well as highlighted the role that mental health problems can play in IPV perpetration among military personnel (Marshall *et al.*, 2005). However, it is important to note that violence against an intimate partner is only a subset of family violence. Other family members may be victims of violence. One study in the US has examined and compared family vs stranger violence by military personnel (Sullivan & Elbogen, 2014). They found that in a national sample of 1090 veterans, 13% reported aggression towards a family member and 9% toward a stranger during the one-year study period. Factors associated with family violence in this sample included being younger, female, having higher levels of combat exposure and having anger symptoms of PTSD (Sullivan & Elbogen, 2014).

There has yet to be a study that has examined family directed violence, or the factors associated with it, among a UK military population. Previous studies have examined violent behaviour by UK military personnel, and found that it is associated with exposure to combat and post-deployment mental health problems (MacManus *et al.*, 2012; Elbogen *et al.*, 2014; MacManus *et al.*, 2016). However, these studies did not differentiate between family and stranger violence. There is no published data from UK military personnel on how the characteristics of perpetrators of family violence and perpetrators of stranger violence differ and if the risk factors for each type of violence differ.

The main aim of this study was to compare the prevalence of and risk factors for "family" violence (violence against any family member) and "stranger" violence among a representative sample of UK military personnel following return from deployment in Iraq or Afghanistan. The associations between both types of violence and post-deployment mental health problems were also examined.

METHODOLOGY

Study Design and Participants

This study utilised data from a large representative sample of the UK Armed Forces. Participants were identified by the UK Ministry of Defence's (MoD) Defence Analytical Services and Advice (DASA) and a random stratified sampling strategy was used. Special Forces and high-security personnel were excluded.

Data was collected by questionnaire in two phases. During phase one, between 2003 and 2005, 17,000 UK Armed Forces personnel were selected, and sent a questionnaire. The response rate was 61% (Hotopf *et al.*, 2006) and the main reason for non-response was inability to contact participants (Iversen *et al.*, 2007). Participants were classified into two groups: those who were deployed to Iraq (TELIC1) and those who were trained, but not deployed (ERA). Details of this study have been previously described (Hotopf *et al.*, 2006).

During phase two, between 2007 and 2009, participants from phase one were followed up and two other randomly selected samples were added. The first additional sample (HERRICK) consisted of personnel who were deployed to Afghanistan from April 2006 – April 2007 (Fear *et al.*, 2007). The second additional sample (replenishment group) consisted of personnel who had joined the military since 2003 and would have had the opportunity to be deployed to either Iraq or Afghanistan during the study period. During this phase, 9,986 personnel completed the questionnaire and the response rate was 56% (Fear *et al.*, 2010).

The total sample consisted of 8276 regulars and 1710 reserves and was shown to be representative of the UK military population at the time of phase two data collection (Fear *et al.*, 2010). Questions about violent behaviour were asked of participants who had been deployed to Iraq or Afghanistan. Only personnel who had been deployed were included in our study. The final sample consisted of 6711 participants (5741 regulars and 970 reserves).

Data Collection

Data collection was conducted using a self-report questionnaire containing questions on socio-demographic characteristics, pre-military antisocial behaviour (ASB), service history, experiences prior to and during deployment and measures of post-deployment physical and mental health. Participants were sent a letter with instructions and details of the study and were assured that participation was voluntary and research was independent of the MoD.

Outcome Variable

Participants were asked to agree or disagree with statements related to experiences after returning from their most recent deployment. These began with the stem statement "In the weeks after I came home…" and included "I was involved in physical fights outside my family" (defined subsequently as 'stranger violence') and "I was physically violent towards a family member" (defined subsequently as 'family violence').

Pre-military ASB.

Participants were asked to answer true or false to a series of statements beginning with the stem "When I was growing up…" (Iversen *et al.*, 2007). Participants were categorised as having engaged in pre-military ASB if they answered "true" to "I used to get into physical fights at school", plus any one of the following statements: "I often used to play truant at school", "I was suspended or expelled from school", or "I did things that should have got me (or did get me) into trouble with the police" (MacManus *et al.*, 2011). These questions were selected from a previously used questionnaire on childhood adversity (Iversen *et al.*, 2007)."

Main duty during deployment.

Personnel were asked about their main duty during deployment. They were then classified as having been deployed in either a combat role (those who were involved in direct combat with enemy forces) or a non-combat role (those who were involved in either a combat support role (i.e. operational support) or in combat support services (e.g. logistical support, medical services and engineering)).

Mental health variables.

Symptoms of PTSD were measured in the month prior to questionnaire completion by using the validated National Centre for PTSD checklist (PCL-C) (Blanchard *et al.*, 1996). Participants were categorised as being a PTSD 'case' if they scored 50 or above. Alcohol misuse was measured in the year prior to questionnaire completion by the validated World Health Organization's Alcohol Use

Disorders Identification Test (AUDIT) (Babor *et al.*, 2001; Fear *et al.*, 2007) and participants were categorised as being a 'case' if they scored above 15. Symptoms of common mental health disorders were measured in the month prior to questionnaire completion by using the validated General Health Questionnaire-12 item (GHQ-12) (Goldberg, 1972; Goldberg *et al.*, 1997) and participants were categorised as being a 'case' if they scored four or above. A validated measure of aggressive behaviour (Bliese *et al.*, 2004) was used to score frequency of reported verbal, property or physical aggression or the number of threats of violence in the past month. Questions began with the common stem "During the past month, how often did you…", and included: get angry at someone and yell or shout at them; get angry with someone and kick or smash something, slam the door, punch the wall etc.; get into a fight with someone and hit the person; and threaten someone with physical violence. Participants were given the options of never, once, twice, 3-4 times or five or more times. The frequency scores were totalled and categorised into three levels of aggression: low (score of 0-2), moderate (score of 3-5) and high (score of 6 or more).

Statistical Analyses

Descriptive statistics were used to compare the socio-demographic characteristics of participants who had only reported family violence and those who had only reported stranger violence. Participants who reported both were not included in this comparison. Univariable and multivariable regression analyses (logistic) were used to examine the independent association of a range of socio-demographic, pre-military and military variables, including combat exposure, with both family and stranger violence. Univariable and multivariable logistic regression analyses were also used to examine the associations between both measures of violence and post-deployment mental health factors while adjusting for confounding variables. To account for the potential confounding effect of stranger violence in the analyses of risk factors for family directed violence, the variable 'stranger violence', which included participants who had reported both family and stranger violence, was added as a covariate in the final adjusted models. Similarly, the variable 'family violence' was added to the final risk factor models for stranger violence to account for those participants who had reported both family and stranger violence. Analyses were conducted using the statistical software program STATA, version 11.2 (StataCorp., 2009). Results have been expressed using odds ratios with 95% confidence intervals and statistical significance was defined as $p<0.05$. Weighted percentages and odds ratios were presented to allow for response and sampling weights, along with unweighted cell counts.

RESULTS

The sample consisted of 6711 deployed UK military personnel (Table 1). The majority of the sample was male (96.4%) and in a relationship (72.5%). The median age of the participants was 33.2 years (IQR: 27.2-40). Just over half of the sample had continued their education into their A-levels (or equivalent) or higher, i.e. a degree, or post-graduate degree (51.2%). Of the sample, 92.4% were regular personnel and 71.2% were in the army. Twenty-five percent of the sample reported being deployed in a combat role.

**** INSERT TABLE 1 ****

Family vs Stranger Violence Following Return from Deployment

The prevalence of individuals who reported family violence following return from deployment was 3.6% (n=217). This included any participants who reported perpetrating family violence only (1.3%, n=66), and those who reported perpetrating both family and stranger violence (2.3%, n=150). The prevalence of individuals who reported perpetrating violence against strangers in the weeks immediately following return from deployment was 7.6% (n=455). This included participants who reported perpetrating stranger violence only (5.5%, n=294) and those who reported perpetrating both family and stranger violence (2.3%, n=150) (Numbers do not add up due to missing values, n=368 for participants who did not answer the question on family violence, and n=301 for participants who did not answer the question on stranger violence).

The characteristics of participants who reported perpetrating only family violence (n=66) were compared to those of participants who reported only stranger violence (n=294) and those who reported both family and stranger violence (n=150) (Table 2). Participants who reported only family violence tended to be older and were more likely to be in a relationship than those who reported stranger violence only. Most violence was perpetrated by men (99.1% of stranger violence and 96.4% of family violence). Indeed, a higher proportion of men than women reported stranger violence (8.3% of men vs 1.9% of women) and family violence (3.7% of men vs 1.6% of women). However, whilst men who reported perpetrating violence were much more likely to have perpetrated stranger violence (82.1%) than family violence (17.9%) a different pattern was seen among women who reported being violent. Of women who reported perpetrating violence, the proportion who reported family violence was much higher (45.9%).

Those who reported stranger violence were more likely to have a history of pre-enlistment ASB (50.86%) than those who reported family violence only (25.6%). Although those in the Army were more likely to report being violent to either family or strangers than those in the RAF or Navy, similar proportions of family (87.8%) and stranger violence (89.6) were reported by Army personnel.

RAF personnel were more likely to report being violent to family members (9.0%) than strangers (2.8%), but Royal Navy/Royal Marines were more likely to report the opposite, with stranger violence (7.6%) more prevalent than family violence (3.1%). Both family and stranger violence was more likely to be reported by personnel of lower ranks than Officers, but a higher proportion of family violence (10.9%) than stranger violence (4.3%) was reported by Officers. Among personnel who had left service, 6.7% reported family violence compared to 12.5% who reported stranger violence. The characteristics of participants who reported both family and stranger violence were similar to those who reported stranger violence only.

**** INSERT TABLE 2 ****

In regression analyses adjusted for sociodemographic and military confounding variables, both family directed and stranger violence were strongly associated with pre-enlistment antisocial behaviour (ASB) [adjusted odds ratio (aOR)=2.74 (1.92-3.91) p<0.001; aOR=4.05 (3.13-5.24) p<0.001, respectively]. Both types of violence were associated with younger age, being a member of the Army, and having left service (Table 3). Higher odds of stranger violence were also seen among men (compared to women) and those who were not in a relationship (compared to those who were) (Table 3).

In the final model for family violence, adjusted for 'stranger violence', the odds of family violence were significantly higher among those who had left service compared to those who were still serving. The odds of family violence were significantly lower among Royal Navy/Royal Marines compared to Army personnel. After adjustment for 'family violence', the odds of stranger violence continued to be statistically significantly higher among younger personnel, males, those not in a relationship, those with a history of pre-enlistment ASB, and among those who have left service. The odds of stranger violence were significantly reduced among RAF personnel compared to Army personnel.

**** INSERT TABLE 3 ****

Main duty during deployment

Those in combat roles were more likely to be violent than those in non-combat roles, even after adjusting for socio-demographic and military factors (Table 5). Combat experience also continued to be significantly associated with both family and stranger violence in the final models, adjusted for stranger and family violence respectively.

**** INSERT TABLE 4 ****

Post-Deployment Mental Health and Aggression

Both types of violence were found to be strongly associated with symptoms of PTSD, symptoms of common mental disorder, aggression and alcohol misuse after adjusting for socio-demographic and military factors (Table 6). In the final risk model, while all mental health risk factors and aggression scores continued to be associated with stranger violence, alcohol was no longer statistically significantly associated with family violence.

**** INSERT TABLE 5 ****

DISCUSSION

This study found that among a sample of UK military personnel who had been deployed to Iraq or Afghanistan, self-reported perpetration of violence against both family members and non-family members was common. The prevalence of violence against family members in the weeks following return from deployment was 3.6% compared to 7.8% for stranger violence. Stranger violence was found to be associated with the risk factors that we have observed for general violence in military populations (MacManus *et al.*, 2012; Kwan *et al.*, 2016) and in the general population (Prime, 2001; Ministry of Defence, 2013; Department of Defense, 2014), such as early antisocial behaviour and sociodemographic factors, such as younger age, male gender, lower rank (a proxy for lower social class and level of educational attainment). However, family violence was not found to be associated with many of these usual risk factors. It was more likely to have been reported by those who served in the Army and those who had left service, but no other sociodemographic characteristics were shown to be risk factors for perpetrating family violence in the weeks following return from deployment. Both family and stranger violence were strongly associated with having been deployed in a combat role, and post-deployment mental health problems.

In a recent US study comparing past year family and stranger physical violence among veterans from the Iraq and Afghanistan conflicts, the prevalence of family and stranger violence was 13% and 9%, respectively (Sullivan & Elbogen, 2014). Although the period of prevalence measured was different to our study (past year vs in the weeks following return from deployment), it is notable that the prevalence of family violence was higher than stranger violence in the US sample, whereas in our study of UK personnel stranger violence was twice as commonly reported as family violence. However, this difference may be partially explained by reporting bias. There may be cultural

differences in attitudes to disclosure of family violence in the US and UK and requires further exploration in future research.

Family vs Stranger Violence: characteristics of perpetrators

The sociodemographic profile and military characteristics of those who committed only stranger violence were different to those who committed family violence only. Overall, and not surprisingly, both family and stranger violence were more commonly reported by male participants than females in keeping with results from the US (Sullivan & Elbogen, 2014). However, of the men who reported violence, a much higher proportion reported stranger violence (82.1%) than family violence (17.9%) whereas of the females who were violent, family violence was almost as prevalent as stranger violence (45.9% vs 53.1% respectively). This may be explained by more gender-specific roles and coping styles with females stereotypically being more likely to spend time in the home environment where tensions may be more likely to be manifest (Matud, 2004; Olff *et al.*, 2007). While the results of our study found that a higher proportion of men reported family violence compared to women, this is in contrast with studies comparing IPV perpetration among men and women in the general population which have suggested that men and women are almost as likely to report perpetrating violence against an intimate partner (Archer, 2002).

Those who reported stranger violence, both stranger violence only and along with family violence, tended to conform to the profile of violent offenders in both the general population (Prime, 2001) and the military (MacManus *et al.*, 2012; MacManus *et al.*, 2013; Elbogen *et al.*, 2014), i.e. younger single men with a history of early ASB. In comparison, we found that those who reported only family violence tended to be older, in a relationship and less likely to have a history of ASB compared to those who reported stranger violence. It was also noteworthy that those who reported family violence only were more likely to be officers and in the RAF than those who reported stranger violence. Not surprisingly officers are at lower risk of violence in general (Elbogen *et al.*, 2010; Gallaway *et al.*, 2012; MacManus *et al.*, 2012). Rank is a proxy measure for social class, income, and level of educational attainment, all of which are associated with violent behaviour in the general population (Ministry of Defence, 2013; Department of Defense, 2014). It may not be surprising that when officers are violent, it is more likely to be towards family than strangers as officers tend to be older and more likely to be in a relationship (and therefore have a family). This could also be partially explained by the lower levels of alcohol misuse among officers and other ranks (Fear *et al.*, 2007).

Family vs stranger violence: risk factors

Post deployment violence against strangers was associated with younger age, being single, having a history of pre-enlistment ASB and having left service consistent with previous research (MacManus *et al.*, 2012; Elbogen *et al.*, 2014; Kwan *et al.*, 2016; MacManus *et al.*, 2016). Family violence was not associated with these sociodemographic and military characteristics, except for being in the army and having left service. Those who were no longer serving were more likely to report having perpetrated family directed violence in the weeks following return from deployment compared to those who were still in service. This could be a product of reporting bias as those who have left service no longer have the same concern about the impact that reporting violence might have on their military career and we see a similar association with stranger violence. It is also possible that violent behaviour perpetrated in the weeks following return from deployment was a predictor of subsequently leaving service. More research is necessary to examine this further. The US study that also compared family violence with stranger violence found that, among US Veterans, severe family aggression was associated with younger age and female gender (Sullivan & Elbogen, 2014). Our study did not measure severity of violence. We did not find an association between relationship status and family violence after adjustment for confounding variables. This may be because family violence may be directed at other family members as well, not just spouses and/or partners.

Being in the Army was associated with perpetration of both stranger violence and family directed violence. This is consistent with previous research into both general violence (MacManus *et al.*, 2012; Kwan *et al.*, 2016) and intimate partner violence (IPV) in military populations (Zamorski & Wiens-Kinkaid, 2013). This may reflect several factors including sociodemographic and military factors, such as lower SES and higher exposure to combat. In our study being a member of the Royal Navy/Royal Marines or RAF was associated with reduced risk of family violence compared to the Army, although this did not reach significance for the RAF. This may be due to the residual confounding effect of rank or education as members of the RAF tend to have higher levels of education compared to Navy personnel (data not shown). It is however also noteworthy that, while overall percentage reporting violence perpetration is low among participants, a higher percentage of family violence only than stranger violence only was perpetrated by RAF personnel. By comparison, a higher percentage of stranger violence only than family violence only was reported by Navy personnel. . This is an important difference in behaviour between service branch that has not been identified before to our knowledge and which warrants further exploration.

Combat exposure

This study found that deployment in a combat role was strongly associated with perpetration of violence against both family and strangers. This is consistent with previous research in both the UK and US that has shown that among deployed personnel, exposure to combat increased the risk of violence (Killgore *et al.*, 2008; Booth-Kewley *et al.*, 2010; MacManus *et al.*, 2012; Elbogen *et al.*, 2014; Sullivan & Elbogen, 2014; MacManus *et al.*, 2015; MacManus *et al.*, 2016). These results provide new evidence of the impact of combat exposure on the risk of perpetration of family violence. Exposure to combat may affect military personnel's propensity to violence through a number of mechanisms. Persistent exposure to threat can result in difficulty switching off when back home leading to ongoing hypervigilance to threat, hyperarousal, increased irritability and tendency to react disproportionately aggressively in the home environment (Elbogen *et al.*, 2010; MacManus *et al.*, 2013). Exposure to traumatic events can result in mental health problems associated with violence (Taft *et al.*, 2007). It is also possible that this finding may be partly explained by the character traits required to be deployed in a combat role which predispose to aggressive behaviour in civilian life (MacManus *et al.*, 2013) and which may not have been completely adjusted for in our analyses.

Mental health and aggression

Consistent with US research (Sullivan & Elbogen, 2014), we found mental health problems and aggression to be significantly associated with both family and stranger violence. We found higher risk of family violence among personnel who reported symptoms of PTSD and among those who scored higher on our aggression scale. This adds to previous research into mental health risk factors for IPV perpetration among military personnel in both the US and Canada (Taft *et al.*, 2009; Zamorski & Wiens-Kinkaid, 2013), which also found higher risk of IPV perpetration among personnel with PTSD compared to those without. Aggression is often comorbid with PTSD (Elbogen *et al.*, 2010; Elbogen *et al.*, 2012) and so risk of family violence in the home could be increased further in presence of both.

We found that whilst alcohol misuse was strongly associated with stranger violence, consistent with the wealth of literature on the link between alcohol and violence (Zoričić *et al.*, 2003; Foran *et al.*, 2012; Wright *et al.*, 2012), it was not associated with family violence. Sullivan and Elbogen (2014) also found that alcohol misuse was associated with stranger aggression and severe stranger violence, but not family aggression or severe family violence (Sullivan & Elbogen, 2014). However, this is in contrast to previous research in US and Canadian military populations which suggested that alcohol is a risk factor for intimate partner violence (Fonseca *et al.*, 2006; Zamorski &

Wiens-Kinkaid, 2013). The role of alcohol misuse in stranger violence appears to be more clear cut than its role in violence within the family.

Strengths and Limitations

This is the first study to examine the prevalence of and factors associated with family violence by UK military personnel and to compare to stranger violence following return from deployment. A main strength of this study was that it utilised a large representative sample. However, although this was a large-scale study, and participants were encouraged to respond, family and stranger violence may be underreported and could have resulted in a lack of power. The use of a self-report measure of family directed violence meant that the study was more sensitive than those using conviction data as many incidents of family violence may not be officially recorded (Auty *et al.*, 2015). A limitation of this study, however, was that we did not use a validated measure of family violence, for reasons of space in our questionnaire, and likewise we did not specifically ask if the violence was directed towards a spouse/partner or another family member (i.e. child, sibling, or parent). This makes our results difficult to compare to other research that has focused on intimate partner violence only. Another limitation was the inability to adjust for family violence prior to deployment. Participants who perpetrate family violence prior to deployment would be more likely to engage in this behaviour post-deployment. It is also important to note the relatively small number of females in this study. This study was therefore limited in its ability to explore violence among women and the findings should be considered carefully. Future research should examine violent behaviour using a larger sample of female military personnel.

IMPLICATIONS

There is a wealth of research into violence against strangers perpetrated by military personnel. There has also been research into IPV perpetration by military personnel, but there is still a dearth of research into violence against wider family members other than spouses/partners. Our findings confirm that family violence is prevalent among military families and that the sociodemographic and military characteristics associated with perpetration of family and stranger violence are different. Such information could be used to inform violence risk assessment of military personnel. Currently risk for different types of violence is often not considered separately. In particular, this study highlights that the risk factors for family and stranger violence differ. Absence of the sociodemographic risk factors for stranger violence may not also indicate lower risk of family violence, while combat exposure, mental health symptoms and problems with aggression management are common risk factors for both. Violence reduction programmes increasingly also

consider the risk of partner and family violence and more research to better understand the different risk factors and profiles of perpetrators is vital to the success of such programmes.

CONFLICT OF INTEREST

The UK Ministry of Defence funded the cohort study data collection. The analysis was undertaken by JK as part of a PhD fellowship funded by King's College London and the Medical Research Council. DM, SW, NF, MJ, and LH are currently employed by King's College London. The authors' work was independent of the UK Ministry of Defence, which had no role in the analysis, interpretation or decision to submit this paper. SW is a trustee of the Veteran charity Combat Stress.

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Table 1 Characteristics of Study Sample

Study Sample (N) = 6711	Percentage of Sample* (n)
Age	
<25	14.7 (1064)
25-29	23.6 (1447)
30-34	19.8(1242)
35-39	20.7 (1289)
40-44	12.9 (935)
>45	8.4 (734)
Gender	
Male	91.9 (6061)
Female	8.1(650)
Education	
No Qualification/O Level	48.8 (2900)
A Level/Degree/Post	51.2 (3543)
Marital Status	
In a relationship ±	77.6 (5112)
Not in a relationship§	22.4 (1567)
Antisocial Behaviour	
No	80.2 (5406)
Yes	19.8 (1177)
Status	
Regular	92.4 (5741)
Reserve	7.6 (970)
Rank	
Officer	17.6 (1437)
Non-Commission Officer	63.9 (3941)
Other Rank	18.5 (1333)
Service	
Royal Navy and Royal Marines	11.1 (812)
Army	71.2 (4666)
RAF	17.7 (1233)
Serving Status	

Serving	83.5 (5512)
Discharged	16.5 (1184)

* Percentages are weighted to account for sampling strategy and non-response and numbers may not add up to totals because of missing data

± In a relationship consisted of those who reported being married, living together or in a long-term relationship at the start of the study

§ Not in a relationship consisted of those who were single, divorced or widowed

Table 2 Characteristic profile comparison of family and stranger violence

	Family Violence Only (n=66) %* (n)	Stranger Violence Only (n=294) %* (n)	Both Violence (n=150) %* (n)	Chi2 (df), Pr
Age				
<25	7.53 (14)	55.87 (100)	36.60 (71)	40.141 (8), Pr<0.001
25-29	7.87 (11)	66.21 (86)	25.92 (35)	
30-34	13.24 (9)	62.81 (45)	23.95 (20)	
35-39	26.13 (11)	60.04 (33)	13.84 (8)	
≥40	34.23 (21)	8.31 (30)	18.70 (16)	
Gender				
Male	13.11 (61)	60.24 (289)	26.65 (142)	p = 0.013[a]
Female	23.85 (5)	26.99 (5)	49.17 (8)	
Education				
None/O	13.10 (40)	60.87 (178)	26.03 (90)	0.1121 (2), Pr=0.946
A Level/Degree/Post	14.25 (22)	58.55 (106)	27.19 (55)	
Marital Status				
In a relationship ±	15.40 (52)	56.29 (188)	28.31 (108)	7.4365 (2), Pr=0.024
Not in a relationship§	8.87 (14)	67.45 (106)	23.67 (40)	
Pre-enlistment ASB				
No	19.36 (48)	58.31 (142)	22.33 (68)	15.0089 (2), Pr<0.001
Yes	6.76 (16)	61.33(141)	31.90 (75)	
Status				
Regular	12.79 (53)	59.39 (257)	27.81 (136)	p = 0.113[a]
Reserve	20.22 (13)	62.02 (37)	17.77 (9)	
Service				
Army	12.98 (54)	59.24 (253)	27.77 (135)	p = 0.016[a]
RAF	32.69 (9)	45.39 (11)	21.92 (6)	
Royal Marines and Royal Navy	6.73 (3)	72.90 (30)	20.37 (69)	
Rank				
Officer	27.74 (7)	49.38 (12)	22.88 (8)	p = 0.117

Other Rank≠	12.53 (59)	60.14 (282)	27.33 (142)	
Serving Status				
Serving	27.74 (44)	61.19 (223)	26.35 (117)	3.2802 (2), Pr=0.194
Discharged	12.53 (22)	55.37 (71)	29.06 (33)	

* Percentages are weighted to account for sampling strategy and non-response

± In a relationship consisted of those who reported being married, living together or in a long-term relationship at the start of the study

§ Not in a relationship consisted of those who were single, divorced or widowed

≠ Other ranks include non-commission officers and other ranks

[a] Fisher's Exact text for n<10

Table 3. Socio-demographic, pre-enlistment and military factors associated with stranger violence[a]

	Family Violence Reported		**Odds Ratio (OR) (CI 95%) p**	**Adjusted OR[b] (CI 95%) p**	**Adjusted for reported stranger violence OR[c] (CI 95%) p**	**Stranger Violence Reported**		**Odds Ratio (OR) (CI 95%) p**	**Adjusted OR[d] (CI 95%) p**	**Adjusted for reported family violence OR[e] (CI 95%) p**
	No % (n) 96.42 (6126)	**Yes % (n)** 3.58 (217)				**No % (n)** 92.25 (5955)	**Yes % (n)** 7.75 (455)			
SOCIO-DEMOGRAPHIC FACTORS										
Age*										
<25	14.1 (941)	35.9 (85)	0.93 (0.91-0.96) p<0.001	0.95 (0.92-0.97) p<0.001	1.00 (0.97-1.03) p=0.770	13.19 (859)	34.65 (172)	0.90 (0.88-0.91) p<0.001	0.92 (0.90-0.94) p<0.001	0.92 (0.90-0.94) p<0.001
25-29	23.6 (1319)	25.0 (47)				23.05 (126)	32.24 (127)			
30-34	20.0 (1147)	15.2 (29)				20.08 (1124)	16.35 (66)			
35-39	21.1 (1205)	10.2 (19)				21.67 (1189)	8.85 (43)			
≥40	21.2 (885)	13.7 (22)				22.0 (1523)	7.9 (47)			
Gender										
Male	91.85 (5538)	96.4 (204)	1.0	1.0	1.0	91.35 (5350)	98.12 (441)	1.0	1.0	1.0
Female	8.15 (588)	3.6 (13)	0.42 (0.23-0.76) p=0.004	0.57 (0.31-1.05) p=0.072	0.98 (0.54-1.77) p=0.950	8.65 (605)	1.88 (14)	0.20 (0.12-0.35) p<0.001	0.27 (0.15-0.47) p<0.001	0.22 (0.13-0.38) p<0.001

Education										
None/ O Level	48.51 (2627)	61.38 (130)	1.0	1.0	1.0	47.85 (2513)	61.16 (272)	1.0	1.0	1.0
A Level/ Degree/Post	51.49 (3260)	38.62 (78)	0.59 (0.42-0.84) p=0.003	0.93 (0.63-1.37) p=0.709	0.97 (0.63-1.49) p=0.872	52.15 (3207)	36.84 (168)	0.54 (0.42-0.68) p<0.001	0.98 (0.75-1.28) p=0.894	0.95 (0.70-1.29) p=0.758
Marital Status										
In a relationship [±]	77.93 (4690)	74.88 (161)	1.0	1.0	1.0	75.56 (4584)	67.3 (302)	1.0	1.0	1.0
Not in a relationship[§]	22.07 (1407)	25.12 (54)	1.18 (0.81-1.73) p=0.385	1.10 (0.73-1.66) p=0.645	0.80 (0.51-1.26) p=0.334	21.44 (1342)	32.7 (150)	1.78 (1.39-2.28) p<0.001	1.62 (1.22-2.14) p=0.001	1.71 (1.24-2.35) p=0.001
PRE-ENLISTMENT FACTORS										
Antisocial Behaviour										
No	80.74 (4991)	52.48 (117)	1.0	1.0	1.0	82.51 (4947)	46.66 (213)	1.0	1.0	1.0
Yes	19.26 (1040)	47.52 (91)	3.80 (2.71-5.32) p<0.001	2.74 (1.92-3.91) p<0.001	1.27 (0.83-1.94) p=0.270	17.49 (920)	53.34 (222)	5.39 (4.24-6.86) p<0.001	4.05 (3.13-5.24) p<0.001	3.63 (2.71-4.87) p<0.001
MILITARY FACTORS										
Status										
Regular	92.37 (5238)	93.35 (190)	1.0	1.0	1.0	92.23 (5072)	93.27 (400)	1.0	1.0	1.0
Reserve	7.63 (888)	6.65 (27)	0.86 (0.52-1.44) p=0.572	1.23 (0.70-2.17) p=0.464	1.07 (0.58-1.98) p=0.839	7.77 (883)	6.73 (55)	0.56 (0.60-1.22) p=0.392	1.42 (0.91-2.22) p=0.120	1.51 (0.94-2.42) p=0.085
Service										
Royal Marines and Royal Navy	10.66 (717)	4.14 (12)	0.30 (0.16-0.56) p<0.001	0.36 (0.19-0.69) p=0.001	0.41 (0.21-0.80) p=0.009	10.83 (704)	7.1 (40)	0.51 (0.35-0.75) p<0.001	0.61 (0.41-0.90) p=0.012	0.74 (0.49-1.10) p=0.138

Army	71.41 (4272)	90.91 (190)	1.0	1.0	1.0	70.6 (4112)	90.1 (398)	1.0	1.0	1.0
RAF	17.93 (1137)	4.96 (15)	0.22 (0.12-0.39) p<0.001	0.33 (0.18-0.62) p<0.001	0.55 (0.28-1.06) p=0.075	18.58 (1139)	2.8 (17)	0.12 (0.07-0.20) p<0.001	0.20 (0.11-0.35) p<0.001	0.23 (0.13-0.42) p<0.001
Rank										
Officer	17.89 (1337)	6.5 (15)	0.32 (0.17-0.60) p<0.001	0.71 (0.34-1.46) p=0.349	0.80 (0.37-1.72) p=0.566	18.55 (1345)	4.26 (20)	0.20 (0.11-0.34) p<0.001	0.57 (0.32-1.04) p=0.068	0.59 (0.31-1.13) p=0.110
Other Rank≠	82.11 (4789)	93.5(202)	1.0	1.0	1.0	81.45 (4610)	95.74 (435)	1.0	1.0	1.0
Serving Status										
Serving	84.25 (5066)	69.56 (162)	1.0	1.0	1.0	84.41 (4922)	73.29 (348)	1.0	1.0	1.0
Discharged	15.75 (1048)	15.47 (55)	2.34 (1.60-3.41) p<0.001	2.49 (1.66-3.74) p<0.001	1.68 (1.04-2.72) p=0.036	15.59 (1021)	26.71 (106)	1.97 (1.50-2.60) p<0.001	2.35 (1.72-3.21) p<0.001	2.10 (1.45-3.03) p<0.001

CI, Confidence interval

[a] Data is weighted to account for sampling strategy and non-response

[b] Adjusted for age, sex, education, pre-enlistment antisocial behaviour, rank, service and serving status

[c] Adjusted for confounders (b) as well as those who reported stranger violence

[d] Adjusted for age, sex, education, marital status, pre-enlistment ASB, service, rank, and serving status

[e] Adjusted for confounders (d) as well as those who reported family violence

* Odds ratios and adjusted odds rations are reported for continuous measures

± In a relationship consisted of those who reported being married, living together or in a long-term relationship at the start of the study

§ Not in a relationship consisted of those who were single, divorced or widowed

≠ Other ranks include non-commission officers and other ranks

Table 4 Association between role during deployment and both family and stranger violence[a]

	Family-directed Violence					Stranger Violence				
	Reported		Odds Ratio (OR) (CI 95%) p	Adjusted OR[b] (CI 95%) p	Adjusted for reported stranger violence OR[c] (CI 95%) p	Reported		Odds Ratio (OR) (CI 95%) p	Adjusted OR[d] (CI 95%) p	Adjusted for reported family violence OR[e] (CI 95%) p
	No % (n)	Yes % (n)				No % (n)	Yes % (n)			
Non-Combat	97.73 (4676)	2.27 (111)	1.0	1.0	1.0	95.00 (4604)	5.00 (237)	1.0	1.0	1.0
Combat	92.23 (1330)	7.77 (103)	3.63 (2.62-5.05) p<0.001	2.64 (1.84-3.78) p<0.001	1.92 (1.25-2.94) p=0.003	83.49 (1231)	16.51 (214)	3.76 (2.98-4.75) p<0.001	2.07 (1.60-2.69) p<0.001	1.77 (1.31-2.40) p<0.001

CI, Confidence interval

[a] Data is weighted to account for sampling strategy and non-response

[b] Adjusted for age, sex, education, pre-enlistment ASB, rank, service and serving status

[c] Adjusted for confounders (b) as well as those who reported stranger violence

[d] Adjusted for age, sex, education, marital status, pre-enlistment ASB, rank, service and serving status

[e] Adjusted for confounders (d) as well as those who reported family violence

Table 5 Post-deployment mental health and both family and stranger violence[a]

	Family-directed Violence					Stranger Violence				
	Reported		Odds Ratio (OR) (CI 95%) p	Adjusted OR[b] (CI 95%) p	Adjusted for reported stranger violence OR[c] (CI 95%) p	Reported		Odds Ratio (OR) (CI 95%) p	Adjusted OR[d] (CI 95%) p	Adjusted for reported family violence OR[c] (CI 95%) p
	No % (n)	Yes % (n)				No % (n)	Yes % (n)			
PTSD										
No	97.02 (5862)	2.98 (171)	1.0	1.0	1.0	93.24 (5720)	6.76 (376)	1.0	1.0	1.0
Yes	82.95 (210)	17.05 (43)	6.69 (4.32-10.36) p<0.001	4.37 (2.67-7.15) p<0.001	2.26 (1.19-4.29) p=0.013	70.21 (183)	29.79 (73)	5.86 (4.13-8.31) p<0.001	4.37 (2.96-6.44) p<0.001	3.35 (2.01-5.56) p<0.001
Alcohol										
No	97.47 (5201)	2.53 (123)	1.0	1.0	1.0	95.17 (5130)	4.83 (247)	1.0	1.0	1.0
Yes	90.81 (840)	9.19 (210)	3.90 (2.78-5.48) p<0.001	2.22 (1.49-3.29) p<0.001	1.13 (0.69-1.86) p=0.622	76.78 (745)	50.62 (196)	5.95 (4.67-7.59) p<0.001	3.16 (2.39-4.17) p<0.001	3.09 (2.24-4.25) p<0.001
CMD										
No	97.71 (492)	2.29 (111)	1.0	1.0	1.0	97.71 (4825)	2.29 (274)	1.0	1.0	1.0
Yes	91.39 (1114)	8.61 (98)	4.03 (2.88-5.64) p<0.001	3.54 (2.45-5.11) p<0.001	2.54 (1.66-3.90) p<0.001	91.39 (1064)	3.53 (169)	2.98 (2.34-3.81) p<0.001	2.49 (1.90-3.26) p<0.001	2.02 (1.47-2.76) p<0.001

Aggression score								
Low (0-2)	99.08 (3786)	0.92 (36)	1.0	1.0	1.0	97.69 (3769)	2.31 (91)	1.0
Moderate (3-5)	96.57 (1548)	3.43 (58)	3.81 (2.32-6.24) p<0.001	3.20 (1.87-5.48) p<0.001	2.48 (1.37-4.50) p=0.003	91.62 (1497)	8.38 (121)	3.87 (2.7 p<0.0
High (6+)	85.61 (745)	14.39 (199)	18.04 (11.44-28.44) p<0.001	10.92 (6.57-18.17) p<0.001	5.77 (3.08-10.83) p<0.001	72.22 (645)	27.78 (236)	16.26 (1 21.98) p<

CI, Confidence interval

[a] Data is weighted to account for sampling strategy and non-response

[b] Adjusted for age, sex, education, pre-enlistment ASB, rank, service and serving status

[c] Adjusted for confounders (b) as well as those who reported stranger violence

[d] Adjusted for age, sex, education, marital status, pre-enlistment ASB, rank, service and serving status

[e] Adjusted for confounders (d) as well as those who reported family violence